



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,146	04/08/2004	Naoki Nishiyama	50395-266	6683

20277 7590 02/17/2006

MCDERMOTT WILL & EMERY LLP
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096

EXAMINER

MONBLEAU, DAVIENNE N

ART UNIT	PAPER NUMBER
----------	--------------

2878

DATE MAILED: 02/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/820,146

Applicant(s)

NISHIYAMA, NAOKI

Examiner

Davienne Monbleau

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6 and 8-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6 and 8-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/8/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Art Unit: 2878

DETAILED ACTION

Response to Amendment

The amendment filed on 1/30/06 has been entered. Claims 1, 3, and 8 have been amended. Claims 2, 5, and 7 have been canceled. New claims 9 and 10 have been added.

Claims 1, 3, 4, 6, and 8-10 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "said light-receiving" in line 10. There is insufficient antecedent basis for this limitation in the claim and it is not clear even what this element is.

Claims 9 and 10 are rejected to as being dependent on an indefinite base claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4, 6, 8, and 9, to the extent taught and undersood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmeister et al. (U.S. 2003/0178552) in view of Suzuki (U.S. 4,479,052).

Regarding Claim 1, *Hofmeister* teaches in Figure 3A a light-receiving circuit for receiving an optical signal with a predetermined transmission speed comprising a light-receiving device (102), a bias supply (106, 212) for providing a bias voltage to said light-receiving device (102), said bias supply including a high voltage source (106), a reference resistor (348) for detecting a signal current generated by said light-receiving device (102), and a feedback control circuit (210) for receiving said signal current detected by said reference resistor (348) and feedback controlling said bias supply (106, 212) such that said signal current is maintained to be a predetermined magnitude. *Hofmeister* teaches that the bias supply comprises a voltage controller switch (212) but does not teach that it includes a transistor. *Suzuki* teaches (Figure 1) a photodiode bias circuit comprising a high voltage source (1) and a transistor (3). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a transistor in *Hofmeister*, as taught by *Suzuki*, to control the voltage that is being applied to the photodiode. Furthermore, it is well known in the art that transistors may be known as switching devices in voltage control circuitry.

Regarding Claim 3, *Hofmeister* as modified by *Suzuki* teaches in Figure 3A a current mirror circuit (208) having one input port connected to an output of said transistor of said bias supply (106, 212) and two output ports, one of two output ports being connected to said light-receiving device (102) and the other of two output ports being connected to said reference resistor (348).

Regarding Claim 4, *Hofmeister* as modified by *Suzuki* teaches in Figure 3A a feedback control circuit (210) but does not teach its time constant. It would have been obvious, however, to one of ordinary skill in the art at the time of the invention to use a time constant greater than

Art Unit: 2878

said predetermined transmission speed to provide a stable output signal and prevent excessive signal swing.

Regarding 6, *Hofmeister* as modified by *Suzuki* teaches that the light-receiving device is an avalanche photodiode but does not teach that it is a PIN photodiode. *Hofmeister* does teach in paragraph [0003] that the photodiodes are typically avalanche photodiodes or PIN photodiodes and further teaches in paragraph [0023] that under circumstances the avalanche photodiode may behave like a PIN photodiode. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a PIN photodiode in *Hofmeister* when only high input optical power is used. (See paragraph [0023].)

Regarding Claim 8, *Hofmeister* teaches in Figure 3A an light-receiving circuit for receiving an optical signal having a predetermined transmission speed comprising a high voltage source (106), a voltage control circuit (212) connected to said high voltage source (106) and outputting a controlled bias voltage, a current mirror circuit (208) having one input port connected to said voltage control circuit (212) and two output ports, one of two output ports being connected to said light-receiving for outputting said bias voltage, a photodiode (102) for receiving said optical signal and generating a signal current corresponding to said optical signal by receiving said bias voltage through said current mirror circuit, a reference resistor (348) connected to the other of two output ports of said current mirror circuit, said reference resistor receiving a current corresponding to said signal current, and a feedback control circuit (210) connected between said reference resistor (348) and said voltage control circuit (212), said feedback control circuit (210) controlling in feedback said voltage control circuit (212) such that said current corresponding to said signal current and detected through said reference resistor

Art Unit: 2878

(348) is maintained to be a predetermined magnitude, and wherein said photodiode (102) is an avalanche photodiode. *Hofmeister* teaches that the bias supply comprises a voltage controller switch (212) but does not teach that it includes a transistor. *Suzuki* teaches (Figure 1) a photodiode bias circuit comprising a high voltage source (1) and a transistor (3), which includes a collector, emitter, and base. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a transistor in *Hofmeister*, as taught by *Suzuki*, to control the voltage the is being applied to the photodiode. Furthermore, it is well known in the art that transistors may be known as switching devices in voltage control circuitry and one of ordinary skill in the art would also know the proper electrical connections for each circuit element.

Regarding claim 9, *Hofmeister* does not teach a resistor between the voltage source and the voltage controller. *Suzuki* teaches (Figure 1) a resistor (2) between the high voltage source (1) and the collector of the transistor (30). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a resistor in *Hofmeister*, as taught by *Suzuki*, to control the conductivity of the transistor.

Claim 10, to the extent taught and undersood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmeister in view of Suzuki, as applied to claim 8 above, and in further view of Kaiser (U.S. 6,756,578).

Regarding claim 10, *Hofmeister* as modified by *Suzuki* teaches that the photodiode (102) includes a cathode connected to said current mirror circuit (208) and an anode connected to an transimpedance amplifier, but does not teach an inverting amplifier with a feedback impedance. *Kaiser* teaches (Figure 2) a photodiode bias circuit comprising a photodiode (102) connected to an inverting amplifier with a feedback impedance (see column 7, lines 49-65). It would have

Art Unit: 2878

been obvious to one of ordinary skill in the art at the time of the invention to use an inverting amplifier in *Hofmeister*, as taught by *Kasier*, to reduce the gain and drive the circuit into oscillation.

Response to Arguments

Applicant's arguments with respect to claims 1, 3, 4, 6, and 8-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davienne Monbleau whose telephone number is 571-272-1945. The examiner can normally be reached on Monday through Friday 9-5.

Art Unit: 2878

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Danielle Marblan
DNM

Georgia Epps
Georgia Epps
Supervisory Patent Examiner
Technology Center 2800